

What we claim is:

1. An apparatus for molding a mold by pressurizing a foam mixture composed of particles of aggregate, water-soluble binders, and water, and injecting it into a cavity of a heated metal mold, the apparatus comprising:
  - a hollow rectangular-parallelepiped body having a bottom plate, the bottom plate having an injection hole to inject the foam mixture,
  - a means for containing the foam mixture having functions as a mixing bath to mix the particles of aggregate, the water-soluble binders, and the water, and as a pressurized vessel to inject the foam mixture into the metal mold, and
  - a means for closing and opening the injection hole.
2. An apparatus for molding a mold by pressurizing a foam mixture composed of particles of aggregate, water-soluble binders, and water, and injecting it into a cavity of a heated metal mold, the apparatus being provided with a means for measuring a temperature of the particles of aggregate or the foam mixture.
3. An apparatus for molding a mold by pressurizing a foam mixture composed of particles of aggregate, water-soluble binders, and water, and injecting it into a cavity of a heated metal mold, the apparatus being provided with a means for measuring viscosity of the foam mixture.
4. An apparatus for molding a mold by pressurizing a foam mixture composed of particles of aggregate, water-soluble binders, and water, and injecting it into a cavity of a heated metal mold, the apparatus being provided with a means for measuring moisture of the foam mixture.
5. An apparatus for molding a mold by pressurizing a foam mixture composed of particles of aggregate, water-soluble binders, and water, and injecting it into a cavity of a heated metal mold, the apparatus being provided with any means or any combination of means for measuring a temperature of the particles of aggregate or the foam mixture, the viscosity of the foam mixture, or the moisture of the foam mixture.

6. An apparatus according to any of claims 2–5, further comprising:
  - a hollow rectangular-parallelepiped body having a bottom plate, the bottom plate having an injection hole to inject the foam mixture,
  - a means for containing the foam mixture having functions as a mixing bath to mix particles of aggregate, water-soluble binders, and water, and as a pressurized vessel to inject the foam mixture into a metal mold, and
  - a means for closing and opening the injection hole.
7. An apparatus according to any of claims 2, 5, and 6, wherein the means for measuring a temperature is a contact- or noncontact-type thermo-sensor and is disposed in the means for containing the foam mixture or outside the means for containing the foam mixture.
8. An apparatus according to any of claims 3, 5, and 6, wherein the means for measuring viscosity is any of:
  - a type of a sensor that presses and inserts a probe for measuring viscosity by measuring a load when a top of the probe is press fitted into the foam mixture,
  - a type of a sensor that rotates a probe for measuring viscosity by measuring a load when a top of the probe is rotated in the foam mixture,
  - a type of a sensor that presses, inserts, and rotates a probe for measuring viscosity by measuring a load when a top of the probe is inserted in the foam mixture and is then rotated in the foam mixture, and
  - a type of a sensor that measures apparent viscosity by measuring a flow rate of the foam mixture flowing from an opening of a cylindrical structure when the foam mixture is pressurized.
9. An apparatus according to claim 8, wherein the means for measuring the viscosity is disposed in the means for containing the foam mixture or outside the means for containing the foam mixture.
10. An apparatus according to claim 8, wherein the viscosity of the foam mixture is measured continuously or by every batch.
11. An apparatus according to any of claims 4, 5, and 6, wherein the means for measuring the moisture is either:

a sensor for measuring an electrical resistance of the foam mixture,  
or

a sensor for measuring a weight loss of the foam mixture when the  
moisture is evaporated by heating the foam mixture.

12. An apparatus according to either of claims 5 and 6, the apparatus  
being provided with means for measuring a temperature of the particles of  
aggregate or the foam mixture, viscosity of the foam mixture, and moisture  
of the foam mixture, wherein any means or any combination of these means  
is disposed outside the means for containing the foam mixture.

13. A metal mold for making a mold by using a foam mixture made by  
mixing the particles of aggregate, more than one kind of water-soluble  
binders, and water, wherein the means for communicating gases from the  
cavity of the metal mold to the outside of the mold so that the particles of  
aggregate cannot pass through it is disposed in the metal mold.